

# Architectural Design 2

Course number - 764

Teacher – Mr. Benjamin Kappler

Supervisor - Mr. Mark Wallace

Principal – Mr. Gregory Youngman

Director of Curriculum & Instruction: Ms. Janice Mezier

Superintendent - Dr. John Hannum

Last Revised 2007

**Name of Course:** Architecture 2

**Level of course:** 1.12

**Prerequisites:** Architecture 1

**Course number:** 764

**Number of credits:** 5

**Revised date and Teachers names:** September 5, 2007 – Mr. Benjamin Kappler

**Purpose:** The second year course is designed to prepare students for a future in the field of Architecture. Students will learn more in detail the job of an architect and the job that goes in to an architect's daily life at the office. Students will enhance the habits of neatness, accuracy, and self-discipline through this course. Each student will be required to use his/her creative abilities to complete an individual year long project.

### **General Objectives:**

1. Students will learn that there is more to Architecture than create drawings for a building.
2. Students will learn of the official process of running and working in an architect's office.
3. Students will gain an understanding of framing methods and plans, foundation plans, and wall sections and details.
4. Students will learn the history of architectural style.
5. Students will be able to complete hand drawn architectural renderings.
6. Students will gain knowledge of general construction specifications regarding commercial structures.
7. Students will gain an understanding of commercial drafting.
8. Students will use a variety of advanced architectural CADD and Civil Engineering software to complete upper – level architectural drawings and plans.

Measurement of success in meeting the general goals will be carried out through the following methods of assessment:

Objectives 2, 3  
Objectives 1, 2, 3, 4  
Objectives 2, 3

Independent activities  
Semester long project  
Field Research

**Method of Instruction:** For instructional purpose, the course is divided into two major segments to coincide to each of the semester.

Mini-lessons are presented throughout the course as needed. Mini-lessons may include a short lecture followed by handouts, videos, and/or group discussions. After the mini-lessons are completed, students will work on individuals or group assignments and will receive individual or group assistance as needed.

A mid-term and final exam is used to assess the student's acquisitions of facts and concepts.

It should be noted that, while there is no homework assigned during the course, however there will be classwork that students should be able to finish in class. If students do not finish assignments in class, they are expected to come on their own time to complete the assignments within the specified time period. The time schedule is very strict and necessary. All the work must be completed on schedule or the student will receive a failing grade and then make up the

required work. Excessive absences or not making effect use of class time will result in the student having to make up time after school. The room and equipment is available before school, after school, and for most periods during the days.

Standards Targeted Throughout this Curriculum

**New Jersey Core Curriculum Content Standards (Technology)** = 8.1; A1,A5,A6,A7,A8,A9 B1B,B2,B3,B4,B5,B6,B7,B9,B10,B11,B12 ; 8.2; A1,A2, ; B1,B2,B3,B4,B5,B6 ; C1,C2,C3

**New Jersey Core Curriculum Content Standards (NJCCCS)** = 1.1, 1.2, 1.3, 1.4, 1.5, 1, 3.1,3.2, 3.3,3.4, 3.5, 4.1, 4.2, 4.3, 4.5, 5.1, 5.2, 5.4, and 9.1

**New Jersey Technology Education Standards (NJTES)** = 1.1, 1.2, 1.6, 2.2, 2.5, 2.6, 2.7, 2.16, 2.21, 3.6, 3.14, 4.1, 4.3, 4.7, 4.8, 4.9, 4.10, 4.11, 4.14, 4.15, 4.16, 6.1, 6.6, 6.7, 6.8, 6.9, 6.10, 6.11, 6.12, 6.13, 6.14, 6.16, 6.17, 7.2, 7.3, 7.8, 7.9, 7.13, 7.15, 7.16, 7.18, 7.19, 7.20, 7.21, 7.22, 7.23, 7.25, 7.30, 7.33, 7.35, 7.36, 7.42, 7.44, 7.45, 7.49, 7.51, 7.53, 7.54, 7.55, 7.56, 7.57, 7.58, 7.59, 7.60, 7.61, 7.62, 7.63, 7.72, 7.74, 7.75, 7.76, 7.77, 7.81, 7.82, 7.84, 7.85, 7.86, 7.87, 7.88, 7.90, 7.94, 7.106, 7.108, 7.121, 7.123, 7.124, 7.126, 7.127, 8.1, 8.2, 8.3, 8.4, 8.5, 8.11, 8.17, 8.18 and 8.20

**National Technology Education Standards (NTES)** = 3, 4, 5, 8, 9, 10, 11, 16, 17, 18, 19 and 20

High Point Regional High School's curriculum and instruction are aligned to the State's Core Curriculum Content Standards and address the elimination of discrimination by narrowing the achievement gap, by providing equity in educational programs and by providing opportunities for students to interact positively with others regardless of race, creed, color, national origin, ancestry, age, marital status, affectional or sexual orientation, gender, religion, disability or socioeconomical status.

## Unit 1 – Review of Arch 1

**Time = 5 Days**

**Goal:** To refresh the knowledge of the student with an extensive review of arch 1.

**Objectives:** Students will be able to:

1. Easily recall learned information from Arch 1.

**Audio-Visual needs:** none

**Computer needs/use:** none

**Assignments:** Teacher generated Review Sheets and Assignments

**Lab activities:** None

**Assessment method:** authentic and traditional

## Unit 2 – Historical Perspective

**Time = 20 Days**

**Goal:** Students will gain a historical perspective of architecture by studying period architecture and influential architects of the time.

**Objectives:** Students will gain knowledge toward Period Architecture by studying:

1. Egyptian
2. Classical Influence
3. Renaissance
4. Early American
5. Romantic
6. Victorian
7. Post-Victorian
8. Frank Lloyd Wright
9. Modern Architecture
10. Frank Owen Gehry

**Audio-Visual needs:** Video/Magazines/computer

**Computer needs/use:** Microsoft Word, Microsoft Excel, and Internet

**Assignments:** Student Research about different types of Architectural styles

**Lab activities:** None

**Assessment method:** Authentic

**Standards:** Technology = 8.1 and 8.2

NJCCCS = 1.2, 1.3, 1.4, 1.5, , 3.5, 4.1, 4.2, 4.3, 4.5, 5.2, 5.4, 9.1

NJTES = 1.1, 1.2, 1.6, 2.2, 2.5, 2.6, 2.7, 2.16, 2.21, 3.6, 3.14, 4.1, 4.3, 4.7, 4.8,  
4.9, 4.10, 4.11, 4.14, 4.16, 6.1, 6.6, 6.7, 6.8, 6.9, 6.10, 6.11, 6.12, 6.14,  
6.16, 6.17, 7.2, 7.3, 7.8, 7.9, 7.13, 7.15, 7.16, 7.18, 7.19, 7.20, 7.21,  
7.22, 7.23, 7.25, 7.30, 7.33, 7.35, 7.36, 7.42, 7.44, 7.45, 7.49, 7.51,  
7.53, 7.54, 7.55, 7.56, 7.57, 7.58, 7.59, 7.60, 7.61, 7.62, 7.63, 7.72,  
7.74, 7.75, 7.76, 7.77, 7.81, 7.82, 7.84, 7.85, 7.86, 7.87, 7.88, 7.90,  
7.94, 7.106, 7.108, 7.121, 7.123, 7.124, 7.126, 7.127, 8.1, 8.2, 8.3, 8.4,  
8.5, 8.11, 8.17, 8.18, 8.20

NTES = 3, 4, 5, 8, 9, 10, 11, 16, 17, 20

### **Unit 3 – Design Principles**

**Time = 5 Days**

**Goal:** Students will expand on their knowledge of Design and the variables that improve on house design.

**Objectives:** Students will be able to:

1. Review and Recall Design elements discussed in A1
2. Develop and apply knowledge of Design Principles
  - a. Proportion
  - b. Scale
  - c. Balance
  - d. Rhythm
  - e. Emphasis
  - f. Unity
  - g. Variety

**Audio-Visual needs:** Computer, Magazines

**Computer needs/use:** Microsoft Word, Microsoft Excel,

**Assignments:** Identifying Principles of design

**Lab activities:** None

**Assessment method:** authentic and traditional

**Standards:** Technology = 8.1 and 8.1

NJCCCS = 1.1, 1.2, 1.4, 1.5, 3.5, 4.1, 4.2, 4.5, 5.2, 5.5,

NJTES = 1.1, 1.2, 1.6, 2.2, 2.5, 2.6, 2.7, 2.16, 2.21, 3.6, 3.14, 4.1, 4.3, 4.7, 4.8, 4.9, 4.10, 4.11, 4.14, 4.16, 6.1, 6.6, 6.7, 6.8, 6.13, 7.2, 7.3, 7.8, 7.9, 7.13, 7.15, 7.16, 7.18, 7.19, 7.20, 7.21, 7.22, 7.23, 7.25, 7.30, 7.33, 7.36, 7.42, 7.44, 7.51, 7.53, 7.54, 7.55, 7.56, 7.57, 7.58, 7.59, 7.60, 7.61, 7.62, 7.63, 7.72, 7.81, 7.82, 7.84, 7.85, 7.86, 7.87, 7.88, 7.90, 7.94, 7.106, 7.108, 7.121, 7.123, 7.124, 7.126, 7.127, 8.1, 8.2, 8.3, 8.4, 8.5, 8.11, 8.17, 8.18, 8.20

NTES = 3, 4, 5, 8, 9, 10, 11, 16, 17, 20

### **Unit 4 – Introduction to Architectural CAD**

**Time =20 Days**

**Goal:** Students will be able to apply their architectural knowledge to the computer based drafting program.

**Objectives:** Students will be able to:

1. Draw wall.
2. Draw windows
3. Draw doors
4. Stairs
5. Second floor
6. Add items from a template

**Audio-Visual needs:** Computer

**Computer needs/use:** Architectural AutoCAD

**Assignments:** Drawing assignment

**Lab activities:** Drawing of a house on Architectural Auto CAD

**Assessment method:** Classwork

**Authentic:** Design portfolio and journal

**Standards** Technology = 8.1 and 8.2  
NJCCCS = 1.2, 1.3, 3.5, 4.1, 4.2, 4.5, 5.4, 5.5,  
NJTES = 2.5, 2.16, 3.6, 3.14, 4.1, 4.7, 4.8, 4.9, 6.1, 6.4, 6.6, 6.7, 6.10, 6.13, 7.2,  
7.16, 7.18, 7.20, 7.21, 7.41, 7.44, 7.45, 7.53, 7.54, 7.55, 7.56, 7.57,  
7.59, 7.60, 7.61, 7.82, 7.84, 7.85, 7.87, 7.89  
NTES = 8, 9, 10, 11, 20

**Unit 5 – Residential Electric**

**Time = 10 Days**

**Goal:** Students will gain basic knowledge a residential electric system.

**Objectives:** Students will be able to:

1. Identify designated circuits
2. Calculate load requirements
3. Layout a house wiring diagram
4. Identify and apply needs of convenience wiring

**Audio-Visual needs:** Computer

**Computer needs/use:** Architectural Auto CAD

**Assignments:** design wiring schematic for a residential structure

**Lab activities:** None

**Assessment method:** Authentic and traditional

**Standards:** Technology = 8.1 and 8.2  
NJCCCS = 1.2, 1.3, 1.4, 1.5, 3.5, 4.1, 4.2, 4.3, 4.5, 5.2, 5.4, 5.5, 9.1  
NJTES = 1.1, 1.2, 1.6, 2.2, 2.5, 2.6, 2.7, 2.16, 2.21, 3.6, 3.14, 4.1, 4.3, 4.7, 4.8,  
4.9, 4.10, 4.11, 4.14, 4.16, 6.1, 6.6, 6.7, 6.8, 6.9, 6.10, 6.11, 6.12, 6.14,  
6.16, 6.17, 7.2, 7.3, 7.8, 7.9, 7.13, 7.15, 7.16, 7.18, 7.19, 7.20, 7.21,  
7.22, 7.23, 7.25, 7.30, 7.33, 7.35, 7.36, 7.42, 7.44, 7.45, 7.49, 7.51,  
7.53, 7.54, 7.55, 7.56, 7.57, 7.58, 7.59, 7.60, 7.61, 7.62, 7.63, 7.72,  
7.74, 7.75, 7.76, 7.77, 7.81, 7.82, 7.84, 7.85, 7.86, 7.87, 7.88, 7.90,  
7.94, 7.106, 7.108, 7.121, 7.123, 7.124, 7.126, 7.127, 8.1, 8.2, 8.3, 8.4,  
8.5, 8.11, 8.17, 8.18, 8.20  
NTES = 3, 4, 5, 8, 9, 10, 11, 16, 17, 18, 19, 20

**Goal:** Working in groups, students will combine their existing knowledge to produce a cumulative project.

**Objectives:** Students will design a house either in a particular architectural style or selecting specific elements and principles of design to incorporate directly into their house. They will then:

1. Draft an accurate a set of plans using CAD
2. Improve on the design
3. Complete computer drawings
4. Produce an electrical layout
5. Hand drawn presentation/perspective drawings
6. Foam model

**Audio-Visual needs:** Computer

**Computer needs/use:** Microsoft Word, Microsoft Excel, and Architectural AutoCAD

**Assignments:** Drawing Assignments

**Lab activities:** None

**Assessment method:** Authentic and traditional

**Standards:** Technology = 8.1 and 8.2

NJCCCS = 1.1, 1.2, 1.4, 1.5, 3.5, 4.1, 4.2, 4.5, 5.2, 5.5,

NJTES = 1.1, 1.2, 1.6, 2.2, 2.5, 2.6, 2.7, 2.16, 2.21, 3.6, 3.14, 4.1, 4.3, 4.7, 4.8, 4.9, 4.10, 4.11, 4.14, 4.16, 6.1, 6.6, 6.7, 6.8, 6.13, 7.2, 7.3, 7.8, 7.9, 7.13, 7.15, 7.16, 7.18, 7.19, 7.20, 7.21, 7.22, 7.23, 7.25, 7.30, 7.33, 7.36, 7.42, 7.44, 7.51, 7.53, 7.54, 7.55, 7.56, 7.57, 7.58, 7.59, 7.60, 7.61, 7.62, 7.63, 7.72, 7.81, 7.82, 7.84, 7.85, 7.86, 7.87, 7.88, 7.90, 7.94, 7.106, 7.108, 7.121, 7.123, 7.124, 7.126, 7.127, 8.1, 8.2, 8.3, 8.4, 8.5, 8.11, 8.17, 8.18, 8.20

NTES = 3, 4, 5, 8, 9, 10, 11, 16, 17, 18, 19, 20

## Unit 8 – Final Presentation

**Time = 10 Days**

**Goal:** Students will gain knowledge and improve on their presentation skills by displaying their work in front of the class.

**Objectives:** Students will exhibit their project with:

1. Advanced Floor plans and computer drawings
2. Presentation/Perspective Drawing
3. Foam Model of the house
4. Written summary of their experience

**Audio-Visual needs:** Computer

**Computer needs/use:** Microsoft Word, Microsoft Excel, Microsoft PowerPoint, Internet and Architectural AutoCAD

**Assignments:** Presentation

**Lab activities:** None

**Assessment method:** authentic and traditional

**Standards:** Technology = 8.1 and 8.2

NJCCCS = 1.2, 1.4, 3.1, 3.3, 3.5, 4.2, 4.3, 4.5, 5.2, 5.5,

NJTES = 1.1, 1.2, 1.6, 2.2, 2.5, 2.6, 2.7, 2.16, 2.21, 3.6, 3.14, 4.1, 4.3, 4.7, 4.8, 4.9, 4.10, 4.11, 4.14, 4.15, 4.16, 6.1, 6.6, 6.7, 6.8, 6.9, 6.10, 6.11, 6.12, 6.13, 6.14, 6.16, 6.17, 7.2, 7.3, 7.8, 7.9, 7.13, 7.15, 7.16, 7.18, 7.19, 7.20, 7.21, 7.22, 7.23, 7.25, 7.30, 7.33, 7.35, 7.36, 7.42, 7.44, 7.45, 7.49, 7.51, 7.53, 7.54, 7.55, 7.56, 7.57, 7.58, 7.59, 7.60, 7.61, 7.62, 7.63, 7.72, 7.74, 7.75, 7.76, 7.77, 7.81, 7.82, 7.84, 7.85, 7.86, 7.87, 7.88, 7.90, 7.94, 7.106, 7.108, 7.121, 7.123, 7.124, 7.126, 7.127, 8.1, 8.2, 8.3, 8.4, 8.5, 8.11, 8.17, 8.18, 8.20

NTES = 3, 4, 5, 8, 9, 10, 11, 16, 17, 18, 19, 20

## Unit 9 –3D PRINTING AN ARCHITECTURAL MODEL

**Time = 5 Days**

**Goal:** Students will plan, prepare, and print a 3D building model.

**Objectives:** Students will:

### **PLAN**

5. Analyze their existing computer building model to best determine what aspects of the structure need to appear in the physical form to best exemplify the concept of the building model.

### **PREPARE**

6. Develop a hybrid of the existing computer building model for 3D printing. This model should consist of only the essential elements to convey the design of the home and have a structural wall thickness of .25 inches. This will eliminate waste and allow the model to be strong and durable for 3D printing.
7. Export the building file as a STL.

### **PRINT**

8. Import using Zprint software and follow instructions provided by instructor.
9. Use tools and materials provided to “finish” the model by removing powder (to be recycled) and applying hardener resin (so the model will last over time).

**Audio-Visual needs:** Computer, 3D printer

**Computer needs/use:** ZPrint Software, Building Modeling Software

**Assignments:** Student Research

**Lab activities:** None

**Assessment method:** Traditional

**Standards:** Technology =

NJCCCS =

NJTES =

NTES =

### **Materials/Resources:**

**Text:** Spence, William. Architecture: Design-Engineering-Drawing. Peoria, IL: Glencoe/McGraw Hill, 1991.

Hepler, Donald, Wallach, Donald, and Hapler, Dana. Architecture: Drafting and Design. Peoria, IL: Glencoe/McGraw Hill, 1998.

AutoCAD Architectural Desktop User's Guide. Autodesk, Inc. 1999

Jefferis and Madsen, Architectural Design and Drafting, 4<sup>th</sup> edition

Supplemental Text: Architecture/Design, Engineering, Drawing;architecture – residential drawing and design by Kicklighter; Architectural Styles by Wallach

**Tools:** Drafting instrument and supplies

IBM Compatible Computer

Architectural AutoCAD program

**Labs:** Teacher Constructed Handouts

**People:** Individuals, such as professional masons, professional architects, professional contractors and et cetera, may be added to lessons, where needed and at the individuals convince.

**Audio-Visual:** Video: The American House: A guide to Architectural Styles.

Video: The Griffin One House

Video: Architect

Video: Architectural Design & Drafting Video Series – Demo Tape

### **Assessment:**

- A. **Student Progress:** The assessment of student progress in the objectives cited on the previous pages will be primarily by, but not limited to, the following criteria:

Class work – Each assignment will be given an individual point value. Students will be made aware of that value when assignments are handed out.

Quizzes – 25 Points

Participation/ Use of class time – 25pts/Week

Projects – 50 Points

Final Project – 200 Points

Final Presentation = `100 Points

### **Letter Grade and Number Grade Equation**

100 to 97.5 = A+

90 to 87.5 = B+

80 to 77.5 = C+

70 to 67.5 = D+

97.4 to 93.5 = A

87.4 to 83.5 = B

77.4 to 73.5 = C

67.4 to 63.5 = D

93.4 to 90.1 = A-

83.4 to 80.1 = B-

73.4 to 70.1 = C-

63.4 to 60.1 = D-

Below 60 = F

**Note:** Authentic assessment methods are ways of evaluating student abilities in a process-based classroom; these methods include: design portfolios and journals, student presentations/demonstrations, oral exams, teacher observation, student self-assessment. The primary purpose of assessment is to assist the students in the learning process. When identified, student's strengths are used to help guide them toward areas in which they will excel. The teacher selects the most appropriate assessment method(s) for each behavioral objective during learning activities.

**B. Periodic evaluation of objectives and this curriculum guide:**

With the selection of a new text, every five years, administration request.

Next schedule evaluation date 8/11

**Special Course Policies:**

A typical week in course might include:

Students will be involved in a lecture about Architecture, its fields and purpose. Handouts emphasizing the lesson that was just taught and possibly a quiz will follow up the lectures by the end of the week. Active student participation is required, and is necessary to understand the lessons that are being taught.

A typical week in course might include: Students will come into class and begin work on the drawing assignments with little to no instructions. The student will work on these assignments at their own pace, but must understand that there are deadlines to meet and missing those deadlines will hamper their grade. Students who cannot finish the given assignment in the allotted class time are expected to work on their own time to complete the assignment.

**Supplementary readings and instructors bibliography:**

None

**Homework, Extra Credit Policy**

No extra credit assignments will be given; however students that show consistent extra effort to complete elaborate assignments or students that go above and beyond the call of duty will be rewarded.